AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A thermal mass flowmeter comprising:

means for providing a flow ratio signal and a temperature ratio signal, the flow ratio signal and the temperature ratio signal having a ratio of proportionality that changes with temperature;

means for applying an overheat factor to the flow ratio signal or the temperature ratio signal;

means for applying a temperature correction factor to the flow ratio signal or the temperature ratio signal, the temperature correction factor being determined by a predefined function of a temperature of a fluid; and

means for disproportionately balancing the flow ratio signal and temperature ratio signal when the ratio of proportionality changes with temperature.~~,~~

~~wherein the temperature correction factor is determined by a predefined function of a temperature of a fluid~~.

2. (Currently Amended) The thermal mass flowmeter as claimed in claim 1, wherein the means for providing the flow ratio signal and the temperature ratio signal comprises:

a bridge thermally connectable to the fluid;

a signal conditioner for conditioning signals from the bridge to provide a flow sensor signal, a flow

bridge signal, a temperature sensor signal and a temperature bridge signal; and

means for dividing the flow sensor signal by the flow bridge signal and means to divide the temperature sensor signal by the temperature bridge signal to provide the flow ratio signal and temperature ratio signal respectively.

3. (Currently Amended) The thermal mass flowmeter as claimed in claim 2, wherein the bridge is a Wheatstone bridge having a flow ratio resistive divider and a temperature ratio resistive divider having a ratio of proportionality that changes with temperature.

4. (Original) The thermal mass flowmeter as claimed in claim 2, wherein the bridge comprises:

a flow reference impedance and a flow sensor resistance temperature detector (RTD) for dividing a bridge signal according to a relative impedance of the flow reference impedance and the flow sensor RTD; and

a temperature reference impedance and a temperature sensor RTD for dividing the bridge signal according to a relative impedance of the temperature reference impedance and the temperature sensor RTD.

5. (Original) The thermal mass flowmeter as claimed in claim 2, wherein the bridge comprises:

a flow reference impedance and a flow sensor resistance temperature detector (RTD) for dividing a bridge signal according to a relative impedance

of the flow reference impedance and the flow sensor RTD; and

a thermometer for determining the temperature of the fluid and providing a temperature signal.

6. (Original) The thermal mass flowmeter as claimed in claim 5, wherein the means for balancing comprises means for converting the temperature signal to the temperature ratio signal.

7. (Original) The thermal mass flowmeter as claimed in claim 4, wherein the bridge further comprises:

a thermometer for determining the temperature of the fluid.

8. (Original) The thermal mass flowmeter as claimed in claim 4, wherein the flow sensor RTD is a platinum RTD having a positive temperature coefficient and the temperature sensor RTD is a platinum RTD having a positive temperature coefficient.

9. (Currently Amended) The thermal mass flowmeter as claimed in claim 4, wherein the temperature sensor RTD is a thermistor having a positive or negative temperature coefficient and the flow sensor RTD is a thermistor having a positive or negative temperature coefficient.

10. (Original) The thermal mass flowmeter as claimed in claim 4, wherein a ratio of a value of the flow reference impedance to a value of the flow sensor RTD is substantially equal to a ratio of a value of the

temperature reference impedance to a value of the temperature sensor RTD at a predetermined ambient temperature.

11. (Original) The thermal mass flowmeter as claimed in claim 4, wherein a sum of a value of the flow sensor RTD plus a value of the flow reference impedance is substantially less than a sum of a value of the temperature sensor RTD plus a value of the temperature reference impedance.

12. (Original) The thermal mass flowmeter as claimed in claim 4, wherein the bridge comprises a three-wire connection for connecting the flow sensor RTD to the signal conditioner.

13. (Original) The thermal mass flowmeter as claimed in claim 4, wherein the bridge comprises a three-wire connection for connecting the temperature sensor RTD to the signal conditioner.

14. (Original) The thermal mass flowmeter as claimed in claim 4, wherein the bridge comprises a four-wire connection for connecting the flow sensor RTD to the signal conditioner.

15. (Original) The thermal mass flowmeter as claimed in claim 4, wherein the bridge comprises a four-wire connection for connecting the temperature sensor RTD to the signal conditioner.

16. (Original) The thermal mass flowmeter as claimed in claim 12, wherein the signal conditioner comprises

means for canceling losses in the three-wire connection and means for providing the flow bridge signal and the flow sensor signal.

17. (Original) The thermal mass flowmeter as claimed in claim 13, wherein the signal conditioner comprises means for canceling losses in the three-wire connection and means for providing the temperature bridge signal and the temperature sensor signal.

18. (Original) The thermal mass flowmeter as claimed in claim 14, wherein the signal conditioner comprises means for canceling losses in the four-wire connection and means for providing the flow bridge signal and the flow sensor signal.

19. (Original) The thermal mass flowmeter as claimed in claim 15, wherein the signal conditioner comprises means for canceling loses in the four-wire connection and means for providing a temperature bridge signal and a temperature sensor signal.

20. (Original) The thermal mass flowmeter as claimed in claim 5, wherein the flow bridge signal substantially represents a signal of the flow reference impedance.

21. (Original) The thermal mass flowmeter as claimed in claim 5, wherein the flow bridge signal substantially represents a signal of the flow reference impedance plus a signal of the flow sensor RTD.

22. (Original) The thermal mass flowmeter as claimed in claim 5, wherein the temperature bridge signal

substantially represents a signal of the temperature reference impedance.

23. (Original) The thermal mass flowmeter as claimed in claim 5, wherein the temperature bridge signal substantially represents a signal of the temperature reference impedance plus a signal of the temperature sensor RTD.

24. (Original) The thermal mass flowmeter as claimed in claim 1, wherein the means for balancing the flow ratio signal and the temperature ratio signal comprises means for substituting a predefined virtual temperature signal for the temperature ratio signal.

25. (Currently Amended) The thermal mass flowmeter as claimed in claim 1, wherein the means for balancing the flow ratio signal and the temperature ratio signal comprises means for applying a predetermined gas compensation factor to the flow ratio signal or the temperature ratio signal, whereby the gas compensation factor disproportionately balances the flow ratio signal and the temperature ratio signal by correcting for variations in gas composition.

26. (Original) The thermal mass flowmeter as claimed in claim 1, wherein the temperature ratio signal is a substantially linear function of the temperature of the fluid.

27. (Original) The thermal mass flowmeter as claimed in claim 1, further comprising means for converting the

temperature ratio signal for providing a temperature signal.

28. (Previously Presented) The thermal mass flowmeter as claimed in claim 2, wherein the flow bridge signal is a substantially linear function of a flow rate of the fluid.

29. (Previously Presented) The thermal mass flowmeter as claimed in claim 2, wherein the means for balancing comprises means for converting the flow bridge signal for providing a flow rate signal.

30. (Original) The thermal mass flowmeter as claimed in claim 1, wherein a type of the predefined function is chosen from a list consisting of linear, quadratic, cubic, and piece-wise linear.

31. (Previously Presented) A method of calibrating a thermal mass flowmeter, the method comprising the steps of:

sequentially operating the flowmeter with a fluid at two or more predetermined temperatures and at a predetermined fluid flow rate;

determining respective values of a temperature calibration factor at each temperature; and

determining parameters of a function using the respective values of the temperature calibration factor and values of the temperature,

wherein the function defines a relationship between the temperature of the fluid and a temperature correction factor,and

wherein the step of determining respective values of the temperature calibration factor comprises a step of balancing a flow ratio signal and a temperature ratio signal at each temperature using the respective temperature calibration factor.

32. (Original) The method as claimed in claim 31, wherein the step of sequentially operating the flowmeter comprises a step of sequentially operating the flowmeter with a fluid at two or more predetermined temperatures and at a no-flow fluid rate.

33. (Cancelled)

34. (Original) The method as claimed in claim 31, wherein the step of determining respective values of the temperature calibration factor comprises a step of applying the respective temperature calibration factor to the flow ratio signal or the temperature ratio signal.

35. (Original) The method as claimed in claim 31, wherein the step of determining respective values of the temperature calibration factor comprises a step of applying an overheat factor to the flow ratio signal or the temperature ratio signal.

36. (Original) The method as claimed in claim 31, wherein the step of determining respective values of the temperature calibration factor comprises a step of

adjusting the flow signal or temperature signal using a gas compensation factor.

37. (Original) The method as claimed in claim 31, wherein the step of sequentially operating the flowmeter with a fluid at two or more temperatures comprises a step of determining the flow rate using a bridge signal.

38. (Original) The method as claimed in claim 31, wherein the step of determining respective values of the temperature calibration factor and values of the temperature comprises a step of determining the values of the temperature using a ratio of a temperature sensor signal and a bridge signal.

39. (Original) The method as claimed in claim 31, wherein the step of determining respective values of the temperature calibration factor and values of the temperature comprises a step of determining the values of the temperature using a temperature sensor signal.

40. (Original) The method as claimed in claim 31, wherein the step of determining parameters of a function comprises a step of curve fitting a polynomial using a least-squares method to the values of the temperature calibration factor.

41. (Original) The method as claimed in claim 31, wherein the step of determining parameters of a function comprises a step of fitting a piece-wise linear function to the values of the temperature calibration factor.

42. (Original) The method as claimed in claim 31, further comprising steps of:

sequentially operating the thermal mass flowmeter with the fluid at two or more predetermined temperatures;

determining a value of a respective bridge signal at each temperature; and

determining a amount of error between two different values of the bridge signal.

43. (Original) The method as claimed in claim 42, further comprising a steps of determining if the amount of error is less than a predetermined value.

44. (Currently Amended) A method for determining a flow rate of a fluid comprising the steps of:

thermally connecting a bridge to the fluid;

conditioning signals from the bridge using a signal conditioner to provide a flow sensor signal and a temperature sensor signal, wherein a ratio of proportionality between the flow sensor signal and the temperature sensor signal changes over a temperature range;

applying an overheat factor to the flow sensor signal or the temperature sensor signal wherein the overheat factor ~~is a predetermined constant representing a~~ corrects for a changing ratio of proportionality between the flow sensor signal and the temperatuee sensor signal ~~difference in~~ resulting from changes in temperature ~~across the bridge~~;

applying a temperature correction factor, determined by a predefined function of a temperature of the fluid, the temperature correction factor being applied to the flow sensor signal or the temperature sensor signal; and

balancing the ratio of proportionality between the flow sensor signal and the temperature sensor signal as the ratio of proportionality changes with temperature by providing a bridge signal to the bridge.

45. (Currently Amended) The method as claimed in claim 44, wherein the step of thermally connecting a bridge to the fluid comprises a step of thermally connecting a disproportionately controlled and balanced Wheatstone bridge to the fluid wherein two dividers of the Wheatstone bridge have a ratio of proportionality that changes over a temperature range.

46. (Previously Presented) The method as claimed in claim 44, wherein the step of conditioning signals using a signal conditioner comprises steps of canceling losses in a three-wire connection and providing a flow bridge signal and the flow sensor signal.

47. (Previously Presented) The method as claimed in claim 44, wherein the step of conditioning signals using a signal conditioner comprises steps of canceling losses in a three-wire connection and providing a temperature bridge signal and the temperature sensor signal.

48. (Previously Presented) The method as claimed in claim 44, wherein the step of conditioning signals using a signal conditioner comprises steps of canceling losses in a four-wire connection and providing a flow bridge signal and a flow sensor signal.

49. (Currently Amended) The method as claimed in claim 44, wherein the step of conditioning signals using a signal conditioner comprises steps of canceling [[loses]] losses in a four-wire connection and providing a temperature bridge signal and a temperature sensor signal.

50. (Previously Presented) The method as claimed in claim 44, wherein the step of balancing the flow sensor signal and the temperature sensor signal circuit comprises a step of substituting a predefined virtual temperature signal for the temperature sensor signal.

51. (Currently Amended) The method as claimed in claim 44, wherein the step of balancing the flow sensor signal and the temperature sensor signal ~~circuit~~ comprises a step of adjusting the flow signal or the temperature signal by a predetermined gas compensation factor.

52. (Original) The method as claimed in claim 44, wherein the step of applying the temperature correction factor to the flow sensor signal or the temperature sensor signal comprises a step of determining the temperature of the fluid using a ratio

of the temperature sensor signal and a temperature bridge signal.

53. (Original) The method as claimed in claim 44, wherein the step of applying the temperature correction factor to the flow sensor signal or the temperature sensor signal comprises a step of determining the temperature of the fluid using a thermometer.

54. (Currently Amended) The method as claimed in claim 44, further comprising a step of determining the flow rate using the disproportionately balanced bridge signal.

55. (Currently Amended) The method as claimed in claim 46, further comprising a step of determining the flow rate using the disproportionately balanced flow bridge signal.

56. (Original) The method as claimed in claim 44, further comprising a step of determining the temperature of the fluid using the temperature sensor signal.

57. (Original) The method as claimed in claim 44, further comprising a step of determining the temperature of the fluid using a thermometer.

58. (Previously Presented) The thermal mass flowmeter as claimed in claim 4, wherein the bridge comprises a three-wire connection for connecting, via first and second wires, the flow sensor RTD to the signal

conditioner, wherein the three-wire connection further includes a third wire connected to a ground side of the flow sensor RTD.

59. (Previously Presented) The thermal mass flowmeter as claimed in claim 4, wherein the bridge comprises a three-wire connection for connecting, via first and second wires, the temperature sensor RTD to the signal conditioner, wherein the three-wire connection further includes a third wire connected to a ground side of the temperature sensor RTD.